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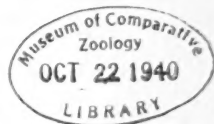
No. 2

A NEW POCKET MOUSE FROM EASTERN
CALIFORNIA

G. M. Allen

BY

B. P. BOLE, Jr.



In the course of the Cleveland Museum of Natural History's Saline Valley Expedition of 1934 several pocket mice of a hitherto unrecognized race were collected. They may be known as:

***Perognathus longimembris salinensis*, subsp. nov.**

SALINE VALLEY POCKET MOUSE

Type.—Spec. No. 6242, adult male, skin and skull, Cleveland Museum of Natural History; collected by P. N. Moulthrop, March 29, 1934. Original Number: SVE-242.

Type Locality.—1 Mi. N. of Salt Camp, elev. 1060 feet, on the west edge of the salt lake, Saline Valley, Inyo County, California.

Distribution.—Mesquite thickets and woodlands on the floor of Saline Valley, chiefly west of the salt pans.

General Characters.—A well-marked race of *Perognathus longimembris* distinguished from others of the general region by its small size, pallid coloration and by numerous cranial characters.

Color.—Type, in winter pelage: Surface of upperparts pale ochraceous buff, lightly overlain with brownish and blackish; the hairs pale neutral gray at their bases on the rump, pallid neutral gray on the shoulders; top of head same color as back; sides same as back, except for a clear lateral line of pale ochraceous buff unmingled with darker colors; sides of face paler than the sides; underparts white to the roots of the hairs; tail pale ochraceous buff, slightly darkened above terminally; an indistinct tuft present; feet very pale, paler than back, sides or tail, almost white; ears slightly paler than back, but darkened about their edges.

Skull.—Very different from that of other races of the region, being much smaller in nearly every measurement, and very much smaller in certain ones, such as the length of the nasals, width of the rostrum at the anterior premaxillary borders as seen from above, interorbital width, maxillary toothrow, etc. The bullae project posteriorly farther beyond the occipital projection than in any other race the writer has seen.

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Measurements.—Type: Total length, 130 mm.; tail, 74; hindfoot, 17.5; occipito-nasal length, 19.5; basilar length, 13.9; mastoid breadth, 11.6; interparietal, 2.0x3.6; inter-orbital width, 4.9; nasals, 7.5; maxillary toothrow (alveolar borders), 3.1; greatest width of first left upper molar, 0.9; width of rostrum at anterior premaxillary borders, 2.1. For measurements of other specimens, see the following tables. There it will be seen that the interparietal of the type is the shortest of the series.

Remarks.—In order to determine satisfactorily the relationships of this *Perognathus*, it was necessary to measure series of specimens from several parts of Inyo County. The accompanying tables and charts indicate the results obtained. Before they can be appreciated to the fullest extent, a note on the distribution of *Perognathus longimembris* in the region in question is in order.

Saline Valley is an oval bowl some ten by twenty-eight miles in length. The floor of the valley lies at an elevation of one thousand feet above sea level, while the lowest point in the encircling mountain rim is a pass at slightly over 5000 feet in the Panamint Mountains, which separate Saline and Death Valleys. Another pass, at 5200 feet, leads northward over the Last Chance Range and the massif locally known as the "Middle Mountains" into the Eureka Valley. Southwards the only low egresses are a pair of passes, both over 6000 feet, in the "Hunter" Mountains that connect the Panamint and Inyo ranges. From Owens Valley on the west, Saline is separated by the stupendous scarp of the Inyo Mountains, which rise from 7000 to 10,000 feet above the valley floor.

Owens Valley is inhabited by the typical form of the *longimembris* group of pocket mice (see Grinnell, 1933, p. 147). This form ranges from the northern part of Owens Valley south along the eastern base of the Sierra Nevada, crossing the range at its southern extremities. It is fairly typical only on the western side of Owens Valley. The east side, in the vicinity of Keeler, is inhabited by an animal described by Elliot as *Perognathus pericalles* (1903, p. 252). This animal is synonymized under *P. longimembris longimembris* by Grinnell (loc. cit.). It is an exceedingly variable form, and is not very close to typical *longimembris* in the opinion of the writer, although the ultimate disposition of the name "*pericalles*" is not the concern of the present paper. Keeler, the type locality of "*pericalles*", is only seventeen miles from the type locality of *salinensis*, but within those seventeen miles every vegetational belt from desert scrub to cold sub-alpine pine forests is represented. The Inyo Mountains, on which this complex occurs, harbors no race of *longimembris* as yet discovered, except in its southeastern foothills. These rise from the Darwin Plateau, and there the form occurring is not *salinensis* and not *pericalles*, but *panamintinus*, a larger, heavy-bodied, dark-colored animal characteristic of the *Grayia* and tree yucca belts of the Panamint and Hunter Mountains and the Lee Flat—Darwin region.

A series of pocket mice from the Coso Hills several miles southeast of Keeler have the measurements of *panamintinus* and the color of typical *longimembris*. They are probably intermediate between these two races. They seem no closer to "*pericalles*" than to *panamintinus*, if as close. The "*pericalles*" series examined, one of the eight topotypical specimens kindly loaned by the Museum of Vertebrate Zoology, is unique among those series examined, in the great breadth of the skull in comparison to its length.

Compared to typical *longimembris*, *salinensis* is so much smaller in all measurements except interparietal length that were it not for the existence of *panamintinus* the Saline Valley form might well be recognized as specifically distinct. The maximum measurements of a series of fourteen male *salinensis* lie in nearly all cases below the minima of a series of twelve male *longimembris* from Independence in Owens Valley. In color the two forms are not dissimilar, but the Saline animals are paler and lack the pinkish suffusion of the Owens Valley series.

Comparison with the "*pericalles*" series from Keeler is difficult because of the extraordinary variability of this stock. In the length of the nasals, which are short, the Keeler animals approach the *salinensis* series. This is also the case with the occipito-nasal and basilar lengths of the skull, but in the case of the mastoid breadth they are the farthest from *salinensis*. Thus the skull of *salinensis* is, at a glance, much slenderer, especially across the braincase; the tympanic bullae are more inflated, projecting much farther behind the occiput; the rostrum is very much slenderer, although of about the same length; and the teeth are smaller individually and in series. Externally, the hind-foot of *salinensis* is diminutive in comparison to "*pericalles*" and the pale ochraceous of the upper parts is paler in fresh pelages than in that stock.

Compared to series of *panamintinus* from Lee Flat and the Jackass Springs region, *salinensis* differs so amazingly in color that it is separable on this basis alone. In nearly all the cranial measurements taken, the *salinensis* averages are well below those of the mountain form, although the maxima of the one series overlap the minima of the other broadly. The proportions of the skulls of the two series are similar however, except in the slenderer rostrum of the lowland form and its much weaker dentition. The relationship of *salinensis* to *panamintinus* is definitely closer than to any other form of the immediate region, as might be expected on geographical grounds, since *panamintinus* is the Saline animals' nearest neighbor—much, much nearer, ecologically, than "*pericalles*". In this connection it is interesting that the small series from Jackass Springs (Grapevine Canyon) in the Panamint Mountains is somewhat paler on the average than specimens from Lee Flat or from the Panamint Mountains farther to the southeast, and indicate a slight tendency towards *salinensis*, although their measurements fail to corroborate this. Intergradation between the two forms, if it occurs at all, presumably occurs at the extreme south end of Saline Valley and in the lower reaches of Grapevine Canyon.

Cranially, *salinensis* is closer to *bangsi* of the Colorado desert than to any of the nearer forms. Most of the cranial measurements of the type of *bangsi* are almost exactly the average measurements of the *salinensis* series. But in tooththrow, width of the first upper molar, and the width of the rostrum, the Saline Valley form is easily separable, being smaller in each case, while its external measurements are much smaller than in any specimen of *bangsi* examined by me. The small hind foot of the northern animal is again definitive.

In summary, it appears that at some time in the past a stock of pocket mice of the *longimembris* group became established on the floor of Saline Valley, where dense thickets of mesquite and screw-bean afforded it suitable cover and food supply. Presumably this stock originated from colonies of *panamintinus* inhabiting the higher

elevations of the valley walls to the south and east, but may have come from *bangsi* which most clearly resembles the present day race inhabiting the valley. It is most unlikely that the ancestors of *salinensis* came over the Inyos from Owens Valley, since those high mountains are inhabited by a very different fauna characterized by *Callospermophilus*, the mountain bluebird, the Clarke crow, and other species of subalpine affinities. *Perognathus* does not occur there above 7000 feet, and *Perognathus longimembris* does not occur at all so far as is known. It is equally unlikely that the ancestors of *salinensis* came from the north, since the source of supply would probably then have been the dark race *nevadensis* which is not known to occur south of Oasis, in Mono County. The so-called "Middle" Mountain mass lying between Oasis and Saline Valley is apparently uninhabited by any race of *longimembris*.

Specimens examined.—

Perognathus longimembris longimembris:

SAN DIEGO COUNTY: La Puerta Valley, 1¹

LOS ANGELES COUNTY: Lancaster, 1¹

INYO COUNTY: West Side of Owens Lake, 6²; Grays Meadow, 1; Independence, 18; Lower Centennial Springs, Coso Hills (not typical), 12; Lone Pine Creek, 23.

Perognathus longimembris panamintinus:

INYO COUNTY: Lee Flat, 16; Grapevine Canyon, 1 mi. W. of Jackass Springs, Panamint Mountains, 4; Willow Spring, 1¹; "Panamint Mts.", (presumably Tucki Mt. region), 1¹; Townes Pass, 1; Perognathus Flat, 8 (Topotypes).

Perognathus longimembris bangsi:

YUMA COUNTY (ARIZ.): Parker, 1¹.

RIVERSIDE COUNTY: Whitewater, 1¹; Palm Springs, 2¹ (type and topotype).

Perognathus longimembris salinensis:

INYO COUNTY: Salt Camp, Saline Valley, 21; North Sand Dunes, Saline Valley, 1.

Perognathus pericallus Elliot:

INYO COUNTY: Keeler, 8 (topotypes)³; 2 Mi. S. E. of Keeler, 1.

¹ Museum of Comparative Zoölogy, ² U. S. Biological Survey Coll., ³ Museum of Vertebrate Zoology.

REFERENCES

- ELLIOT, D. G. 1903, Dec. Description of twenty-seven apparently new Species and Subspecies of Mammals. Field Columbian Museum Publication No. 87. Zool. Ser., Vol. III, No. 14.
- GRINNELL, J. 1933, Sept. 26. Review of the Recent Mammal Fauna of California. Univ. Calif. Publ. Zool. Vol. 40, No. 2, pp. 71-234.

Spec. No.	Total Length	Tail	Hindfoot	Occipito-nasal Length	Basilar Length (Henselian)	Mastoid Breadth	Interparietal Length x Breadth	Interorbital Width	Nasals	Maxillary Toothrow	Greatest Width of M ₁	Width Nasals at Pre- maxillary borders
6607♂	142	85	20	22.3	15.4	12.0	2.4x4.0	5.7	8.8	3.5	1.1	2.3
6609♂	145	81	20	22.1	15.5	12.3	2.5x4.5	5.3	9.0	3.5	1.1	2.2
6610♂	148	84	20	22.9	16.0	12.3	2.7x4.4	5.5	9.1	3.5	1.1	2.3
6611♂	145	81	19.5	22.6	15.5	12.6	2.6x4.2	5.8	9.0	3.3	1.0	2.5
6612♂	150	82	20						8.5	3.5	1.0	2.4
6613♂	147	84	20		15.5	12.2	2.6x4.4	5.6	9.1	3.5	1.0	2.1
6614♂	139	78	19.5					5.7	9.0	3.5	1.1	2.4
6618♂	147	83	20	22.5	15.5	12.4	2.5x4.0	5.9	9.1	3.6	1.1	2.4
6619♂			20	22.4	15.2	12.2		5.3	9.0	3.6	1.0	2.4
6620♂	150	83	20	23.1	15.7	12.6	2.5x4.1	5.3	9.5	3.6	1.2	2.3
6621♂	145	79	19.5	22.7		12.4	2.7x4.6	5.7	9.1	3.5	1.1	2.5
6608♂	143	80	19.5									
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Averages	145.54	81.81	19.83	22.57	15.54	12.33	2.54x4.27	5.58	9.02	3.51	1.07	2.35
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6615♀	146	83	19.5	22.4	15.5	12.5	2.5x4.0	5.3	9.0	3.5	1.2	2.3
6622♀	145	78	19.5	22.3		12.1	4.1	5.4	9.0	3.6	1.1	2.3
6623♀	139	81	19.5	22.3	15.4	12.3	2.9x4.3	5.5	8.9	3.5	1.0	2.4
6624♀	143	81	19.5				2.5x4.6	5.6	9.0	3.7	1.2	2.3
6717♀	142	73	19	22.2	15.1	11.8	2.6x4.2	5.3	9.2	3.5	1.0	2.3
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Averages	143	79.2	19.4	22.3	15.33	12.17	2.62x4.24	5.43	9.02	3.56	1.10	2.32

TABLE I. Measurements of a series of *Perognathus longimembris longimembris*, all from Independence, Inyo County, California, elevation, 3800 feet, except number 6717, which was taken at Grays Meadow, five miles southwest, at an elevation of 5600 feet.

Spec. No.	Total Length	Tail	Hindfoot	Occipito-nasal Length	Basilar Length	Mastoid Breadth	Interparietal Length x Breadth	Interorbital Width	Nasals	Maxillary Tooththrow	Greatest Width of M ₁	Width of Rostrum at Anterior Dorsal border of Premaxillae
6659♂	133	70	20	21.8	15.0	12.2	3.0x4.0	5.7	8.4	3.5	1.0	2.3
6660♂	138	70	20	21.9	14.9	12.1	2.6x3.8	5.4	8.3	3.4	1.1	2.3
6661♂	147	77.5	19.5	21.7		12.1	2.7x4.3	5.5	8.5	3.4	1.0	2.1
6662♂	128.5	68	19	21.4	14.9	12.2	2.9x3.8	5.4	8.1	3.4	1.0	2.2
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Averages	136.62	71.37	19.62	21.7	14.93	12.15	2.8x3.97	5.5	8.32	3.42	1.03	2.23
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6652♀	136	70	19	21.3	14.6	12.2	2.6x3.6	5.2	8.1	3.4	1.2	2.3
6653♀	135	71	20	21.8	15.0	12.3	2.6x3.7	5.5	8.2	3.4	1.1	2.3
6654♀	120	68	19.5	21.2	14.7	11.9	2.8x3.6	5.2	8.2	3.5	1.0	2.0
6655♀			19.5	21.7	15.1	12.4	2.2x3.9	5.5	8.8	3.4	1.2	2.3
6656♀	138	70	19	22.1	15.0	12.2	2.5x3.4	5.0	8.5	3.5	1.2	2.2
6657♀	131	72	18				2.7x4.0	5.0	8.2	3.3	1.0	2.2
6658♀	128.5	70	18	20.8	14.5	12.1	2.4x3.9	5.3	8.0	3.2	1.1	2.0
6663♀			19.5	22.0	15.0	12.3	3.0x4.3	5.3	8.6	3.4	1.1	2.3
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Averages	131.41	70.16	19.06	21.55	14.84	12.2	2.6x3.8	5.25	8.32	3.38	1.11	2.2

TABLE II. Measurements of *Perognathus longimembris* from the Lower Centennial Springs, Northeast base of the Coso Hills, Inyo County, elevation, 5200 feet. These specimens are closest to *panamintinus* in measurements and to typical *longimembris* in color.

Spec. No.	Total Length	Tail	Hindfoot	Occipito-nasal Length	Basilar Length	Mastoid Breadth	Interparietal Length x Breadth	Interorbital Width	Nasals	Maxillary Toothrow	Greatest Width of M ₁	Width of Rostrum at Anterior Dorsal border of Premaxillae
(a)												
Males												
6715♂	133	70	20	21.0	14.5	12.3	3.0x4.5	5.2	8.1	3.5	1.0	2.4
6716♂	136	75	20	21.7	14.9	12.5	2.6x3.8	5.2	8.6	3.3	1.0	2.5
6718♂	138	77	19.5	21.0	14.4	11.8	2.8x4.0	5.2	8.2	3.2	1.0	2.4
6719♂	145	80	19	21.7	15.1	13.0	2.7x4.0	5.6	8.0	3.3	1.1	2.3
6721♂	135	72	19	22.2	15.4	12.6	2.6x4.0	5.5	8.5	3.3	1.0	2.2
6722♂	140	75	19	22.0	15.2	12.4	2.7x4.4	5.7	8.6	3.5	1.0	2.1
6741♂	135	75	20			12.1	2.9x4.3	5.3	8.1	3.4	1.0	2.4
6742♂			20			12.2	2.7x3.8			3.4	1.0	2.2
6745♂	138	74	20	22.0	14.8	12.0	2.7x3.5	5.2	8.5	3.5	1.0	2.1
6746♂	138	74	18		15.0	12.1	2.6x3.4	5.2		3.2	0.9	2.3
6748♂			18.5	22.0	14.9	12.3	2.5x3.7	5.3	8.4	3.3	0.9	2.2
Averages	137.55	74.67	19.36	21.74	14.91	12.3	2.71x3.94	5.34	8.33	3.35	0.99	2.28
(b)												
Females												
6720♀	135	70	20	21.8	14.6	12.7	2.5x3.8	5.2	8.2	3.3	1.2	2.3
6723♀	137	72	18.5	22.4	14.7	12.2	2.9x4.0	5.3	8.5	3.5	1.2	2.3
6743♀	142	76	20	22.1	15.4	12.4	2.5x3.6	5.3	8.5	3.5	1.1	2.2
6744♀	130	64	17.5	21.0	14.6	12.2	2.5x3.6	5.7	8.2	3.3	1.0	2.1
6747♀	138	72	18	21.7	15.0	11.9	2.5x3.5	5.2	8.4	3.4	1.0	2.3
Averages	136.4	70.8	18.8	21.8	14.86	12.28	2.58x3.7	5.34	8.36	3.4	1.1	2.24
(c)												
Grapevine Canyon												
6684♂	125	65	18	20.3	13.5	11.6	2.6x4.0	5.3	7.9	3.0	0.9	2.3
6682♀	134	72	19.5					5.4	8.4	3.3	1.0	2.3
6683♀	133	74	18.5		14.4	11.8	2.9x3.5	5.2		3.3	0.9	
6685♀	137	70	19.5	21.4	15.5	11.8	2.5x3.5	5.3	8.4	3.5	1.0	2.2
Female												
Averages	134.67	72	19.17	21.4	15.0	11.8	2.7x3.5	5.3	8.4	3.37	0.97	2.25

TABLE III. Measurements of *Perognathus longimembris panamintinus* males (a) and females (b) from Lee Flat, fifteen miles north of Darwin, Inyo County; elev. 5200 ft. and (c) of four specimens from Grapevine Canyon, 1 mi. west of Jackass Spring, Inyo County, elev. 5300 feet. Specimen number 6684 is subadult.

Spec. No.	Total Length	Tail	Hindfoot	Occipito-nasal Length	Basilar Length (Henselian)	Mastoid Breadth	Interparietal Length x Breadth	Interorbital Width	Nasals	Maxillary Tooththrow (Alveolar borders)	Greatest Width of M ₁	Width of Rostrum at Anterior border of Prenaxillae
6292♂	137	76	17.5			12.3	2.3x4.0			3.1	0.9	
6320♂			18.0	20.5	14.3	11.8	2.5x3.9	5.1	7.8	3.1	1.8	1.8
6335♂			18.0	20.5	14.0	11.7	3.0x3.9	4.9	8.0	3.0	0.9	1.9
6343♂	130	75	18.5						7.3		0.9	
6332♂	132	83	19.0	20.7	13.8	12.0	2.5x3.6	5.1	7.9	3.1	1.0	2.0
6341♂	128	69	16.0	19.5	13.4	11.7	2.6x3.7	4.9	7.6	3.0	0.9	2.0
6348♂	129	69	18.0				2.5x3.5	4.9		3.1	0.9	
6336♂	137	81	17.0					5.2	7.8	3.0	0.9	2.0
6340♂			19.0			10.9	2.5x3.6			3.1	1.0	
6242♂	130	74	17.5	19.5	13.9	11.6	2.0x3.6	4.9	7.5	3.1	0.9	2.1
6281♂	131	69	19.0	20.3	14.0	12.0	2.4x4.1	4.9	8.0	3.1	1.0	1.8
6346♂	127	73	17.5	19.9	13.9	11.8	2.5x3.8	5.0	7.5	3.0	0.8	2.0
6342♂	138	79	19.0	19.2	13.8	11.6	2.5x4.1	4.8	7.6	3.1	1.0	2.0
6349♂			17.5									
Averages	131.9	74.8	17.96	19.95	13.88	11.72	2.48x3.8	4.97	7.77	3.06	0.91	1.95
6345♀	134	80	20.0	20.4	14.5	11.9	3.0x3.4		7.6	3.0	0.8	2.0
6498♀	133	74	19.0	20.8	13.9	11.5	2.7x3.3	4.8	8.0	3.0	0.9	2.1
6307♀	132	67	18.0	20.3	14.1	11.7	2.9x3.7	4.9	8.2	2.9	0.9	2.1
6327♀	134	70	17.0	19.7	13.8	11.5	2.7x4.0	5.1	7.6	3.0	0.8	1.8
6321♀	129	73	19.0	20.6	14.0	11.4	2.4x3.5	5.0	7.7	3.1	1.0	2.0
6347♀	133	70	17.0								0.9	
Averages	132.5	72.33	18.33	20.36	14.06	11.6	2.74x3.56	4.95	7.82	3.00	0.88	2.0

TABLE IV. Measurements of *Perognathus longimembris salinensis* all from Salt Camp, Saline Valley, elev. 1100 feet, except No. 6498, which was taken at the North Sand Dunes, elev. 1200 feet.

